RNP Solutions in Australia

Australia's PBN Transition brings Opportunities for Active Noise Abatement.

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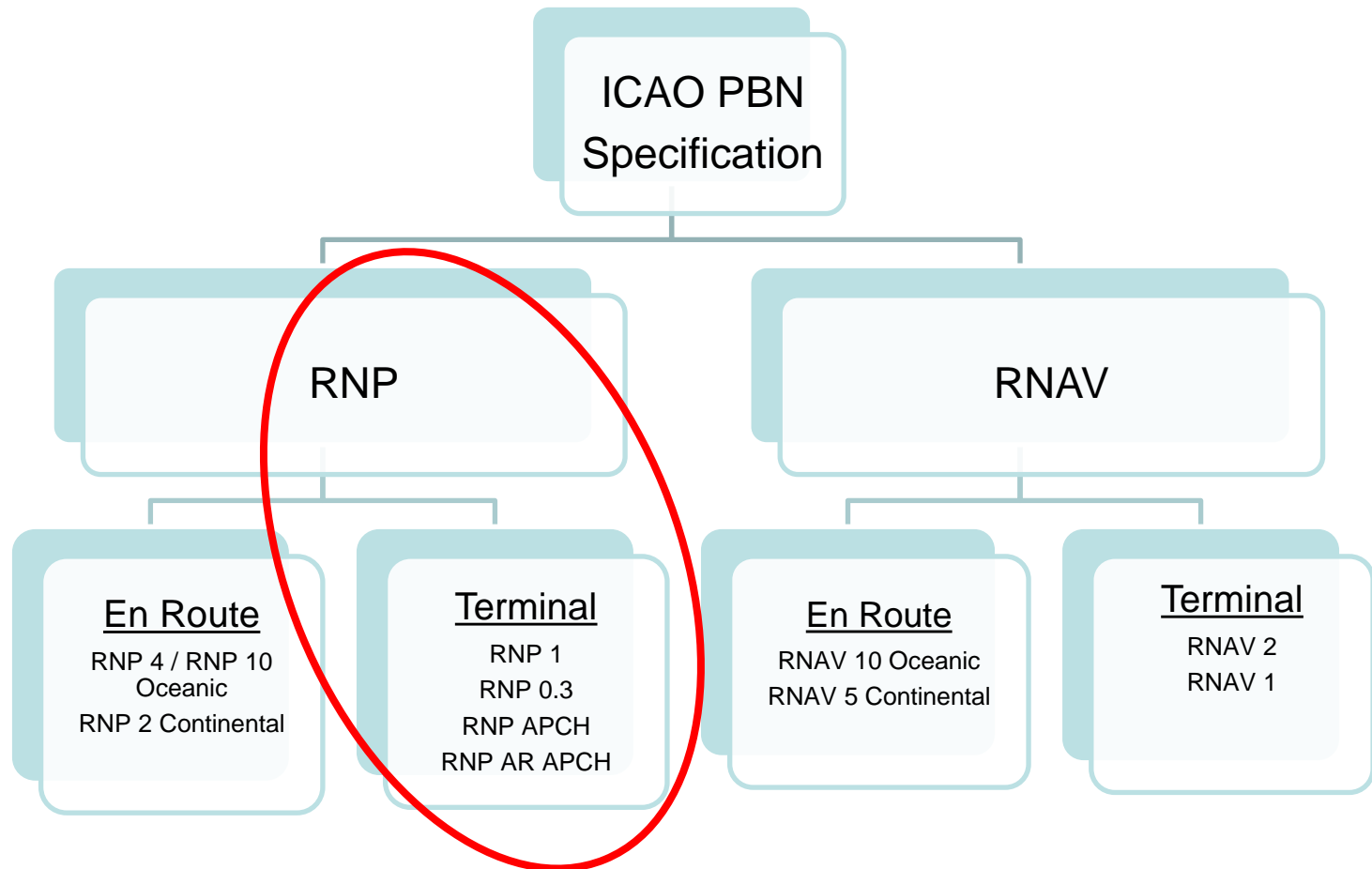
Australian Environment and PBN

Drivers

# Opportunities for Active Noise Abatement in the RNP Family

RNP AR APCH

- Australian History:
  - Qantas sponsored trial which lead to a broader implementation project.
  - Now an ongoing program driven by customer identified need.

- Examples of placing the flight path so the residual noise has less impact:
  - Brisbane 'River Track' and
  - Canberra Runway 35

Brisbane 'River' track

- Demonstration site
  - First flights January 2007
  - 11k participating flights through October 2008
- Replicated an existing visual procedure.
- Three potential areas of noise benefit were suggested as:
  - Higher vertical profile with constant descent.
  - Later landing configuration.
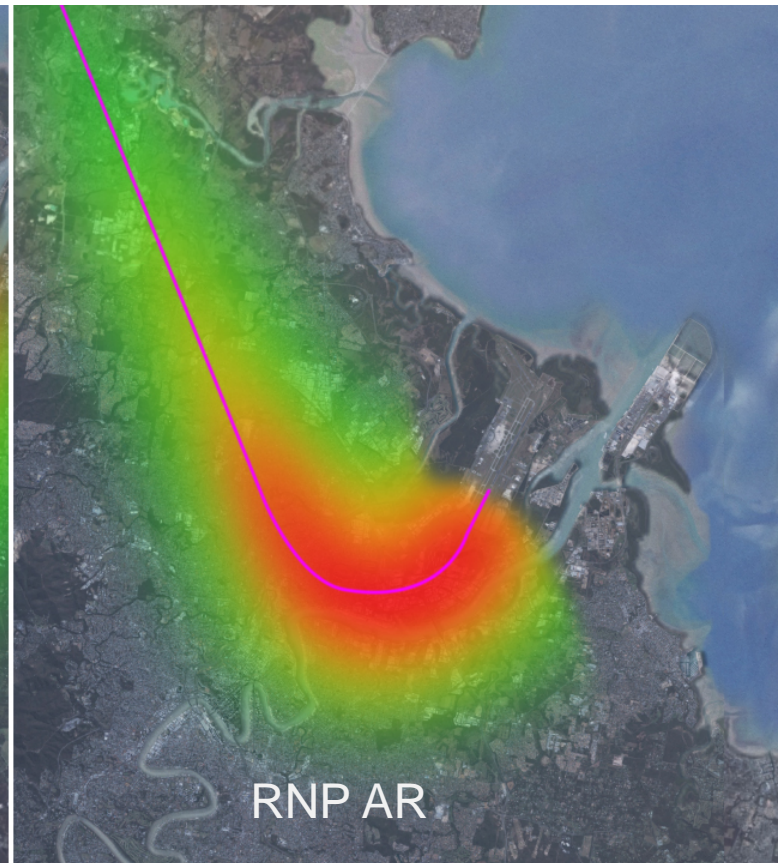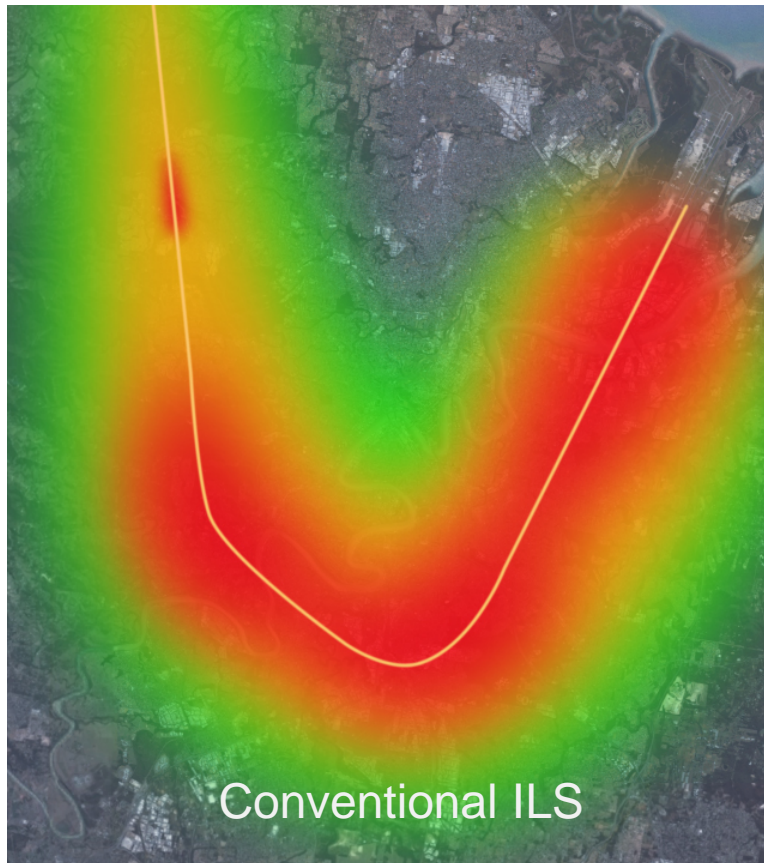 - Residual noise focussed over river and industrial area.
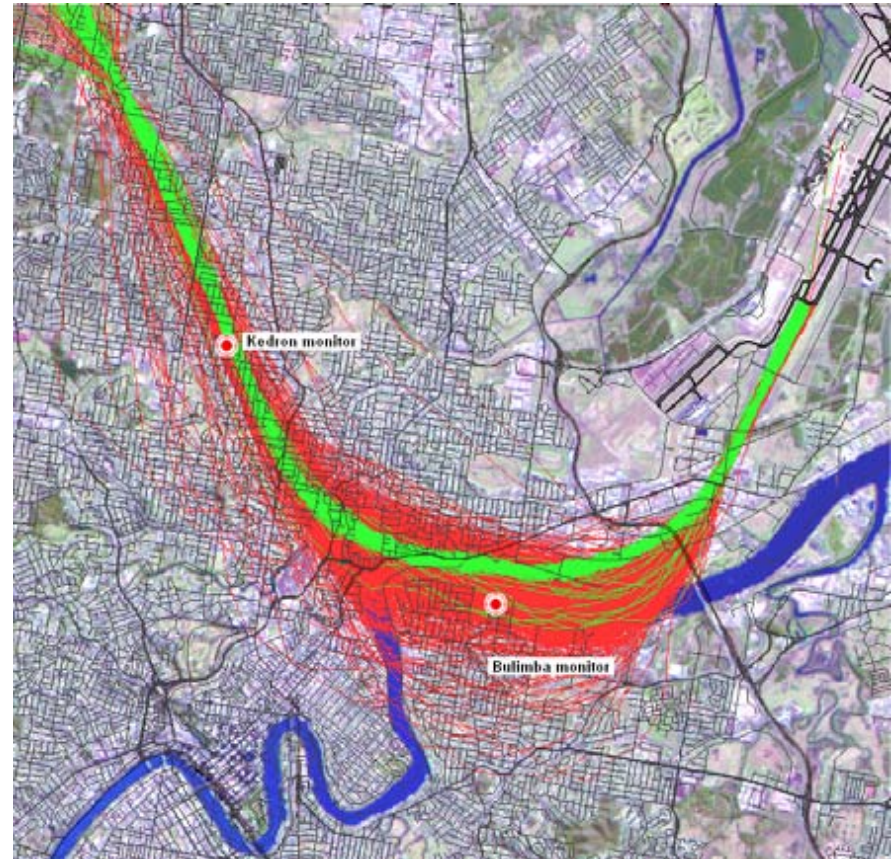
Brisbane 'River' track: Population Overflown

Visual   RNP AR

- Allowing for the navigational accuracy of each procedure the affected population captured by each was

  - Visual procedure (±0.7NM) : 63300

  - RNP AR procedure (±0.3NM) : 24550

Brisbane 'River' track: Noise Contour

Conventional ILS

RNP AR

Canberra RWY35

- 85% of arrivals use RWY35.

- Merge point moved over farmland west of new residential developments in Jerrabombra.

- LAmax reduction of 6 to 10dB(A) forecast.

- Additional benefit from RWY17 missed approach using a similar lateral path.

Vertically Guided RNP Approach

- BaroVNav in the Australian context
- Superior energy management through FMS
- Driver isn't typically necessarily ANA but there is something there

Into the future:

- Extend vertical guidance into STAR phase if there is a need
- Add RF leg to procedures where there is a need.

RNP into xLS

- Flown as a one off as RNP into GLS at Sydney in 2009.

- More recent trials and implementations of both ILS and GLS around the world.

- Procedures well developed and understood.

- Wider trial and deployment planned in Australia for both ILS and GLS final segments.
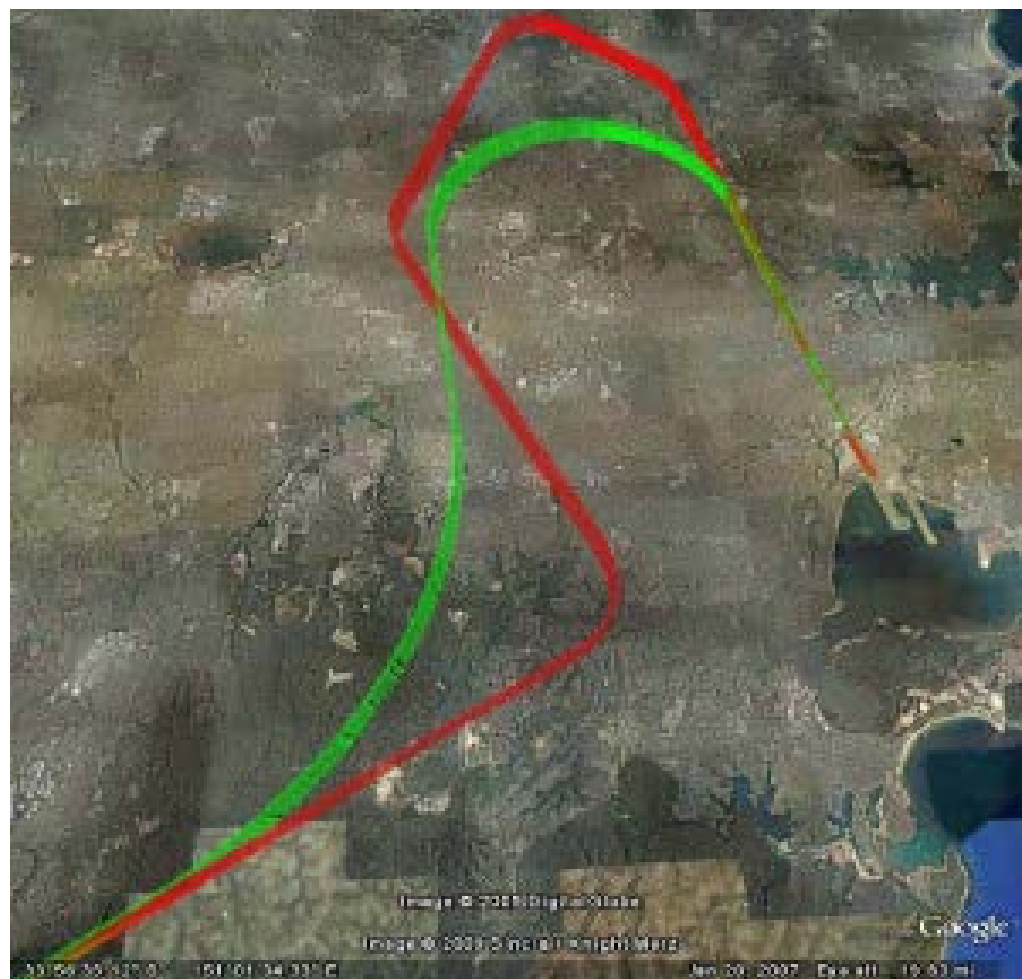
Leveraging GLS Capabilities

Combine the capabilities:

- RNP into GLS
- Adaptive Glideslope
- Displaced Threshold

- **RNP to GLS**
- **1.4NM Short Final**
- **3° glideslope**

- **RNP to GLS**
- **1.4NM Short Final**
- **3.5° glideslope**
- **1000 ft displaced threshold**
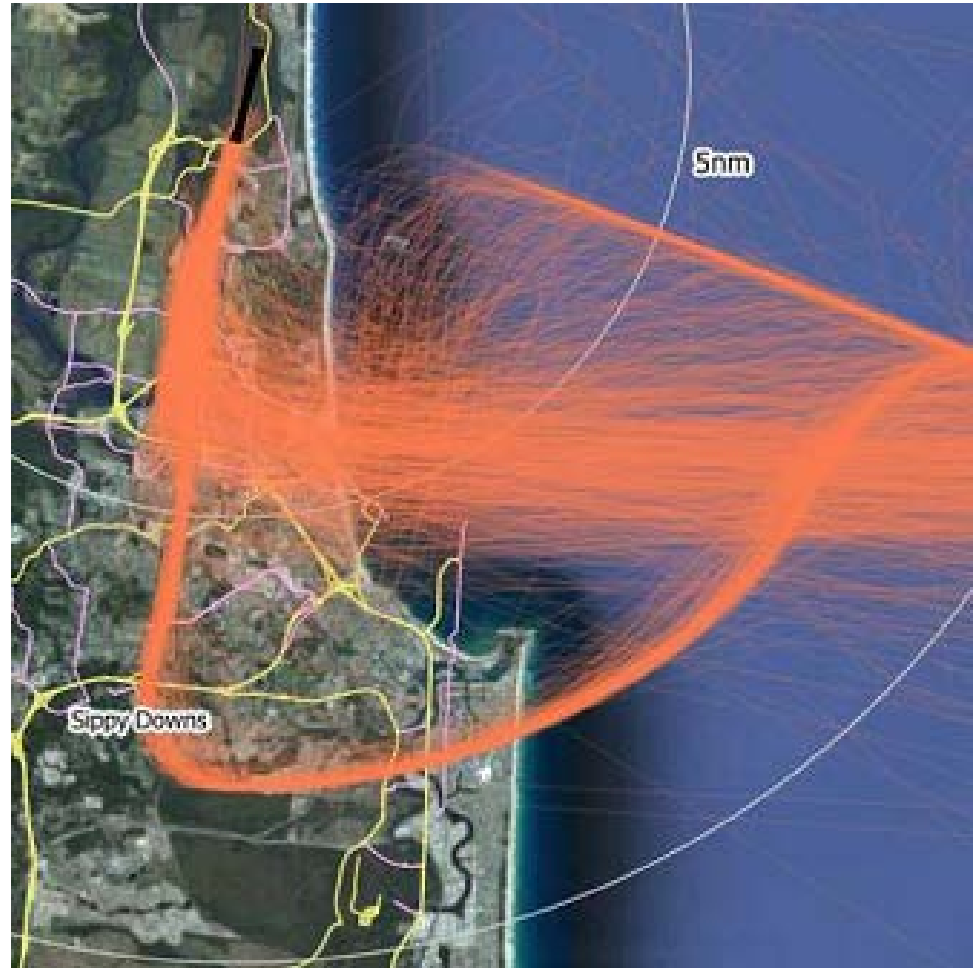
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Constraints

Runway Alignment

Sunshine Coast, RWY36

- No precision approach or RNAV (GNSS) available, only conventional non precision approach.
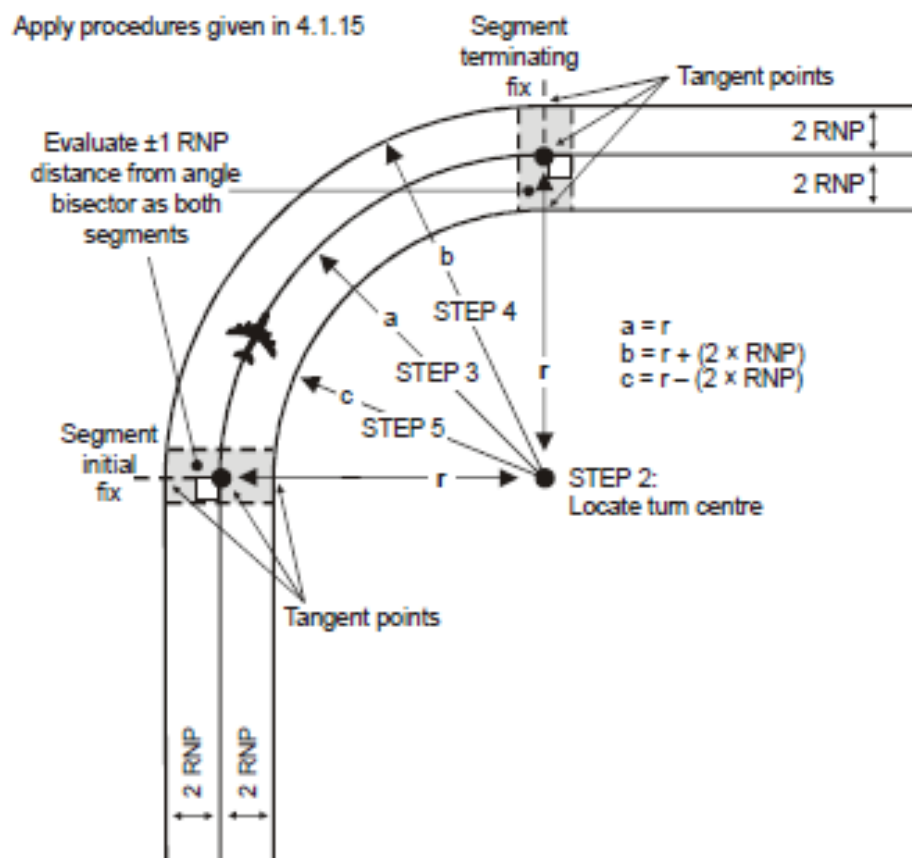
Sunshine Coast, RWY36 RNP AR

- Proprietary procedure limited to A320.

- FROP is 1.22NM from the threshold @ 449ft

- Can't be duplicated with ICAO criteria

Turn Radius: RF Legs

- The RF leg is key to much of the available benefit.
  - Precisely locating turn entry and exit and containing the curved path.

- BUT is limited by:
  - Angle of bank and speed.
  - Tangential entry and exit.

Approach Minima

CATEGORY	A	B	C	C/D
MVD			MVD-N	MVD-2
RNP (0.10)			DA(H) **2381** (507)-2.7	DA(H) **2398** (524)-2.8
RNP (0.15)			DA(H) **2434** (560)-3.0	DA(H) **2461** (587)-3.2
RNP (0.20)	N/A		DA(H) **2779** (905)-5.0	DA(H) **2792** (918)-5.1
RNP (0.30)			DA(H) **3282** (1408)-8.0	DA(H) **3296** (1422)-8.0
CIRCLING			NOT AUTHORISED	
ALTERNATE			TBD	TBD

Lessons

- Consider the whole path and its interaction with surrounding Air Traffic Management procedures not just the approach in isolation.
  - A perfect procedure that can't be issued by ATC is wasted.

- In the Australian environment, RF Legs and vertical guidance offer best return for effort and resources.

- Consultation:
  - Early and often.
  - Community don't particularly care about the technology they care about the outcome.
  - Focus on a win/win outcome not winning the fight.

Thank You

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